

Applicant : Byron Hourmand
Appln. No. : 08/601,268
Page : 7

03
cmd

a detector circuit coupled to said oscillator for receiving said periodic output signal from said oscillator, and coupled to said input touch terminal, said detector circuit being responsive to signals from said oscillator and the presence of an operator's body capacitance to ground coupled to said touch terminal when proximal or touched by an operator to provide a control output signal, wherein said detector circuit includes means for generating said control signal when the sensed body capacitance to ground exceeds a threshold level in order to prevent unintended activation based upon an operator's inadvertent proximity and touch with said input touch terminal.

[

Claim 3, line 2, delete "reference to an external".

9. ~~5.~~ (Amended) A capacitive responsive electronic [The] switching circuit [as defined in claim 1 and further including] comprising:

04

an oscillator providing a periodic output signal having a frequency of 50 kHz or greater;

an input touch terminal defining an area for an operator to provide an input by proximity and touch;

a detector circuit coupled to said oscillator for receiving said periodic output signal from said oscillator, and coupled to said input touch terminal, said detector circuit being responsive to signals from said oscillator and the presence of an operator's body capacitance

62

Applicant : Byron Hourmand
Appln. No. : 08/601,268
Page : 8

to ground coupled to said touch terminal when proximal or touched by an operator to provide a control output signal; and

a floating [ground] common generator coupled to said oscillator for receiving said square wave output signal, said floating [ground] common generator generating a floating [ground] common reference for said detector circuit that is set at a fixed voltage below and tracks the square wave output signal.

10. ~~6.~~ (Amended) The switching circuit as defined in claim ⁹~~5~~, wherein said detector circuit is powered by said square wave output signal provided by said oscillator and by said floating [ground] common reference provided by said floating [ground] common generator [to increase] thereby increasing the sensitivity of said detector circuit to proximity and touching of said touch terminal by an operator's body.

12. (Amended) A proximity and touch controlled switching circuit comprising:

an oscillator providing a square wave output signal having a frequency of 50 kHz or greater;

a touch terminal having a dielectric cover defining an input terminal for coupling to an operator's body capacitance to ground; and

a charge pump circuit coupled to said oscillator for receiving said square wave output signal, and coupled to said touch terminal, said charge pump circuit having an output terminal that supplies an output signal having a voltage that varies when said touch terminal

Applicant : Byron Hourmand
Appln. No. : 08/601,268
Page : 9

is proximal or touched by an operator's body, the voltage of said output signal varies as a function of the area of said touch terminal that is proximal or touched by an operator,

wherein said charge pump circuit includes at least one high speed diode coupled between said oscillator and said touch terminal, for enhancing a sensitivity at which said charge pump responds to sensed body capacitance to ground at said touch terminal for higher frequencies.

13. (Amended) The [touch control] proximity and touch controlled circuit as defined in claim 12 and further including a DC power supply for supplying power to said oscillator and a [reference to an external] ground.

Claim 14, line 1, change "touch control" to --proximity and touch controlled--.

16.

~~15.~~ (Amended) A proximity and [The] touch [control] controlled switching circuit [as defined in claim 12 and further including] comprising:

an oscillator providing a square wave output signal having a frequency of 50 kHz or greater;

a touch terminal defining an input terminal for coupling to an operator's body capacitance to ground;

a charge pump circuit coupled to said oscillator for receiving said square wave output signal, and coupled to said touch terminal, said charge pump circuit having an output

Applicant : Byron Hourmand
Appln. No. : 08/601,268
Page : 10

terminal that supplies an output signal having a voltage that varies when said touch terminal is proximal or touched by an operator's body; and

a floating [ground] common generator coupled to said oscillator for receiving said square wave output signal, said floating [ground] common generator generating a floating [ground] common reference for said charge pump circuit that is set at a fixed voltage below and tracks said square wave output signal,

wherein said charge pump circuit includes at least one high speed diode coupled between said oscillator and said touch terminal, for enhancing a sensitivity at which said charge pump responds to sensed body capacitance to ground at said touch terminal for higher frequencies.

^{17.}
~~16.~~ (Amended) The proximity and touch [control] controlled circuit as defined in claim ¹⁶~~15~~, wherein said charge pump circuit is powered by said square wave output signal provided by said oscillator and by said floating [ground] common reference provided by said floating [ground] common generator [to increase] thereby increasing the sensitivity of said charge pump circuit to proximity and touching of said touch terminal by an operator's body.

[Claim 17, line 1, change " touch control" to --proximity and touch controlled--.

65

Applicant : Byron Hourmand
Appln. No. : 08/601,268
Page : 11

18. (Amended) A capacitive responsive electronic switching circuit comprising:

an oscillator providing a periodic output signal having a predefined frequency;

a plurality of input touch terminals defining adjacent areas on a dielectric substrate for an operator to provide inputs by proximity and touch; and

a detector circuit coupled to said oscillator for receiving said periodic output signal from said oscillator, and coupled to said input touch terminals, said detector circuit being responsive to signals from said oscillator and the presence of an operator's body capacitance to ground coupled said touch terminals when proximal or touched by an operator to provide a control output signal,

wherein said predefined frequency of said oscillator is selected to decrease the impedance of said dielectric substrate relative to the impedance of any contaminate that may create an electrical on said dielectric substrate path between said adjacent areas, and wherein said detector circuit compares the sensed body capacitance to ground proximate an input touch terminal to a threshold level to prevent inadvertent generation of the control output signal.

20. (Amended) A capacitive responsive electronic switching circuit comprising:

an oscillator providing a periodic output signal having a predefined frequency;

a dome-shaped touch terminal defining an area for an operator to provide an input by proximity and touch, wherein the dome shape of the touch terminal is constructed to ergonomically fit the palm of a human hand; and

Applicant : Byron Hourmand
Appln. No. : 08/601,268
Page : 12

As amended.
a detector circuit coupled to said oscillator for receiving said periodic output signal from said oscillator, and coupled to said [input] touch terminal [terminals], said detector circuit being responsive to signals from said oscillator and the presence of an operator's body capacitance to ground coupled to said touch [terminals] terminal when proximal or touched by an operator to provide a control output signal, said detector circuit including means for discriminating between a proximity and touch of said dome-shaped touch terminal by the palm of a human hand and a proximity and touch by a human finger.

21. (New) A capacitive responsive electronic switching circuit comprising:

an oscillator providing a periodic output signal having a predefined frequency;

a touch terminal defining an area for an operator to provide an input by proximity and touch; and

a detector circuit coupled to said oscillator for receiving said periodic output signal from said oscillator, and coupled to said touch terminal, said detector circuit being responsive to signals from said oscillator and the presence of an operator's body capacitance to ground coupled to said touch terminal when proximal or touched by an operator to provide a control output signal, said detector circuit including discriminating means for discriminating between a proximity and touch of said touch terminal covering substantially all of said area of said touch terminal and a proximity and touch covering less than substantially all of said area of said touch terminal.

67

Applicant : Byron Hourmand
Appln. No. : 08/601,268
Page : 13

22. (New) The switching circuit as defined in claim 21, wherein said touch terminal includes a dome-shaped dielectric cover.

23. (New) The switching circuit as defined in claim 21, wherein said touch terminal includes a palm-sized dielectric cover.

24. (New) The switching circuit as defined in claim 23, wherein said discriminating means determines that a proximity and touch of said touch terminal covers substantially all of said area of said touch terminal when said dielectric cover is proximal or touched with the palm of an operator's hand and determines that a proximity or touch covers less than substantially all of said area of said touch terminal when said dielectric cover is proximal or touched with one of an operator's fingers.

25. (New) The switching circuit as defined in claim 21, wherein said discriminating means discriminates between a proximity and touch of said touch terminal covering substantially all of said area of said touch terminal and a proximity and touch covering less than substantially all of said area of said touch terminal based upon a sensed level of body capacitance to ground proximate said touch terminal.

68

Applicant : Byron Hourmand
Appln. No. : 08/601,268
Page : 14

26. (New) The switching circuit as defined in claim 21, wherein said coupling of capacitance to ground occurs when an operator's body is proximate, but not touching, said touch terminal.

27. (New) A capacitive responsive electronic switching circuit for a controlled device comprising:

an oscillator providing a periodic output signal having a predefined frequency;

first and second touch terminals defining areas for an operator to provide an input by proximity and touch; and

a detector circuit coupled to said oscillator for receiving said periodic output signal from said oscillator, and coupled to said first and second touch terminals, said detector circuit being responsive to signals from said oscillator and the presence of an operator's body capacitance to ground coupled to said first and second touch terminals when proximal or touched by an operator to provide a control output signal for actuation of the controlled device, said detector circuit being configured to generate said control output signal when said an operator is proximal or touches said second touch terminal after the operator is proximal or touches said first touch terminal.

28. (New) The capacitive responsive electronic switching circuit as defined in claim 27, wherein said detector circuit generates said control signal only when an operator is proximal

Applicant : Byron Hourmand
Appln. No. : 08/601,268
Page : 15

or touches said second touch terminal within a predetermined time period after the operator is proximal or touches said first touch terminal.

29. (New) The capacitive responsive electronic switching circuit as defined in claim 27, wherein said first and second touch terminals are adapted to be mounted on different surfaces of the controlled device.

29
Cont.
30. (New) The capacitive responsive electronic switching circuit as defined in claim 27, wherein said first and second touch terminals are adapted to be mounted on non-parallel planar surfaces of the controlled device.

31. (New) The capacitive responsive electronic switching circuit as defined in claim 27, wherein said first and second touch terminals are adapted to be mounted on perpendicular planar surfaces of the controlled device.

32. (New) The capacitive responsive electronic switching circuit as defined in claim 27 and further including an indicator for indicating when said detector circuit determines that an operator is proximal or touches said first touch terminal.
